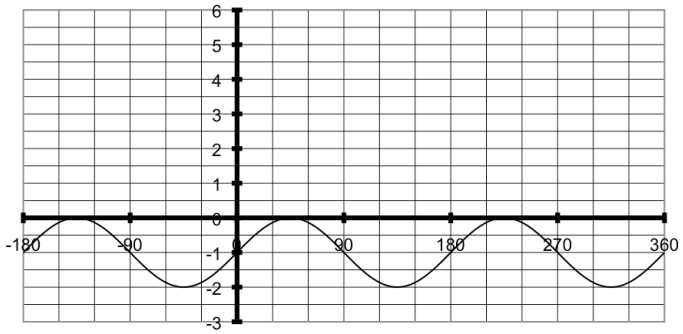
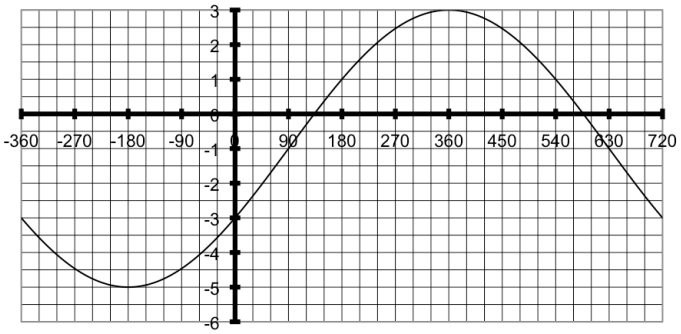
MCR3U Additional review questions (trigonometric functions)

1. Write equations to model the sinusoidal functions shown in the following graphs.

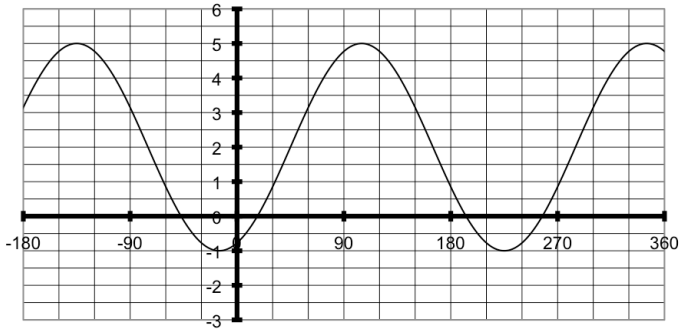
a)



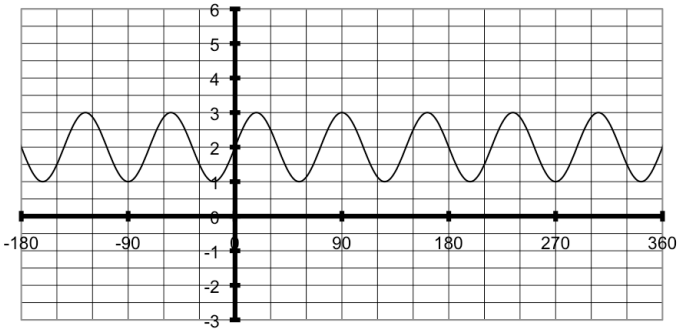
b)



c)



d)



2. The height, h, in metres, of the tide in a given location on a given day at t hours after midnight can be modeled using the sinusoidal function $h(t) = 3.4\sin\left[30(t-7)\right] + 5.2$.

   a) Find the maximum and minimum values for the depth, h, of the water.
   b) What time is high tide? What time is low tide?
   c) What is the depth of the water at 11 am?

3. Create graphs to represent the following sinusoidal functions. Label the amplitude and period of each.

a) $y = -\cos(x - 45^o) - 4$

b) $y = 2\sin\frac{3}{4}(x + 60^o)$

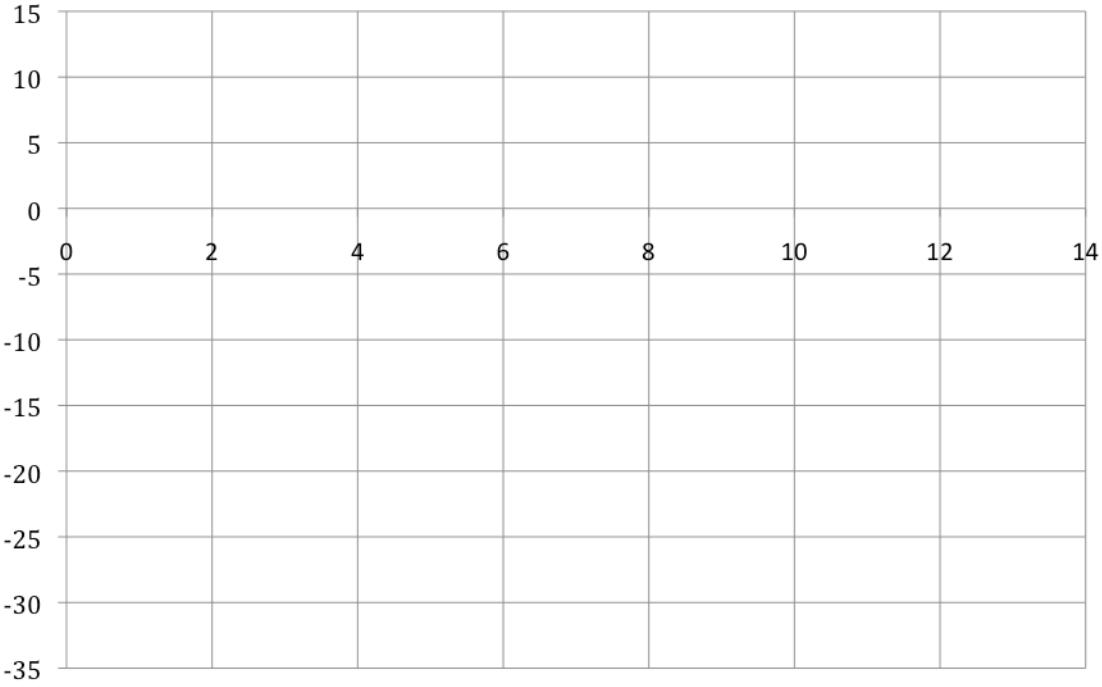
c) $y = 3\sin\frac{1}{2}(x - 60^o) + 3$

d) $y = 4\cos(3x + 315^o) + 1$

4. The following table lists average monthly low temperatures in Yellowknife for one year.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
-31	-28	-24	-13	0	8	12	10	3	-3	-18	-27

a) Determine an equation to model this data.
b) Graph the equation and data below.
c) Describe any discrepancies between the equation and the data.



5. A tide chart at a coastal marina lists the following information one day: 4.6 m high tide at 4:50 am and 1.2 m low tide at 11:00 am. The next high tide will be at 5:10 pm.

a) Estimate the period and amplitude of the tide height at this location.
b) Predict the time of the next low tide.

6. Represent the graph of $f(x) = 5\sin\left[2(x - 60^o)\right]$ with an equation using a cosine function.

7. Textbook questions: p. 347 # 14 and p. 349 # 15.